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ITEMS OF INTEREST.

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Thots from the Profession.

SOME SUGGESTIONS.

DR. D. SCOTT THOMAS, SOMERSET, OHIO.

Wrapping fibres of cotton or floss silk on a fine smooth round a nerve probe may be easily done if the end of the probe is first inserted, a time or two, into a piece of beeswax.

Where the gum persists in bleeding into a cavity, while filling without the rubber dam, tie a coarse thread waxt around the tooth, forcing it well toward the root.

If it is desirable to leave a vent hole for escape of gas from a "dead" tooth, insert the end of a thoroughly waxt linen thread into each root canal, and fill with amalgam around the thread, so that it will not be in contact with the tooth at any place except well up into the root, and when the filling is completed draw out the thread. In a cavity including the side of the tooth, draw the thread from as near the gum as possible to prevent food being forced into the opening.

A convenient engine bit-holder may be made of a square or oblong block of wood, about an inch and a quarter thick, and as long and wide as may suit the fancy (or supply of engine burs), with rows of holes for burs about one-fourth of an inch apart. Place the burs, beginning with the smallest, at the end of a row, and grade them up to the largest of the shape, then follow with another shaped bur in the same order, placing all the sizes of the same shape in one group. It is better than a circular or cone-shaped one, because the different burs are more readily located when wanted, and may be placed in a drawer when not in use.

To preserve the packing in your vulcanizer, always put a small quantity of water in it as soon as the flask is removed after vulcanizing, and close it tightly, leaving it closed till needed again.

Sometimes it may be of advantage to cut the air-chamber pattern in two from front to rear, and place one piece on either side of the cast, leaving one-eighth of an inch or more space between the pieces. [A good idea.—ED. ITEMS.]

The most successful plan I have found to induce patients to "bite" naturally is to request them to bite with their *back* teeth. When they have no back teeth, tell them you have placed some wax in the back part of their mouth, and ask them to bite on it.

The best way to determine the exact amount of rubber required for a plate is to remove the wax from the flask, warm it, and form it into a sheet of the same thickness as the sheet of rubber to be used. This may be done by having a smooth board of suitable size; near each side of which, on the upper surface, place a narrow strip of wood planed to the same thickness of the sheet of rubber, for the ends of the rolling pin (or glass bottle having parallel sides) to run on, and roll the lump of wax into a sheet. Use this sheet of wax as a pattern by which to cut the rubber. A small surplus of rubber should be added to insure the requisite amount.

In removing wax from very deep parts of the flask, an old cavity syringe may be used to force a stream of hot water to the bottom.

To prevent the gum of artificial teeth being broken by the contraction of the rubber in cooling, make the rubber of equal thickness on each side of the edge of the block in danger.

After placing the teeth in the first part of the flask, coat the wax plate with thin shellac varnish, to prevent the tin foil adhering to the wax when opening the flask.

OUR SIGHT.

DR. W. E. DRESCOLL, MANATEE, FLORIDA.

It is surprising how much people abuse their sight. This is because the sight is so strong, generally, in early life, that we become accustomed to violations of the natural laws involved. We cease to abuse our eyes only as warned by failing sight. There are dentists with expensively furnished offices, where the operator faces a most glaring light. He may face such a light for a time without realizing the evil; but this cannot last long, for the day of defective vision will surely come. We see dentists using spectacles at an age at which it would be unnecessary were it not for these thoughtless violations of plain, simple rules which every one should understand and obey. While it is injurious to read or work by a poor light, it is not as bad as having a glaring light in front of the eyes. In fact, a white wall, or object of any kind, that reflects light into the eyes is injurious, and should not be tolerated.

When the dentist first begins to feel the need of spectacles, he should first see how many objects which reflect light into his eyes may be removed or covered with some somber color. Even a white dress, or shirt bosom, may prevent your seeing your work clearly; for these

I have used green veiling. The difference in use and abuse is strikingly illustrated in the difference one experiences in reading, writing, etc., under proper conditions, and the effect of snow, white sand, or water when the sun is shining clear for any considerable time. In the former case no inconvenience is felt; in the latter, real pain and suffering at times and a dullness of vision, not to be misunderstood, follows. To secure comfortable ventilation and still close or obscure windows on the left and at the back of the patient, will require a little ingenuity; but any light or reflected light directly in the rear of the patient is as blinding to the operator as a light immediately at the left of the patient. Yet we sometimes see dentists have an operating-room projecting from the main building, like a large bay window or a pilot house on a steamer. To allow a breeze to pass from windows at the left or at the back of the patient, a screen may be so constructed as to be no obstruction to the circulation of the air, yet be a perfect protection to the dentist's eyes. Details may seem trivial, but seeing distinctly the condition of our work in filling teeth is not unimportant. We all, at times, are baffled in a difficult operation, till by some favorable change we are enabled all at once to get a good view or reflection of light to an obscure point, and a great burden seems to roll off. There is no subject of greater importance to the dentist than the management of lights direct and reflected.

RUBBER AND HOW TO USE IT.

PAPER BY D. GENESE, IN THE SOUTHERN DENTAL ASSOCIATION.

We are not justified in condemning rubber, as has been the case in many instances, because it has been proved to cause sore mouths. But to remove the cause, and to teach the young students how to use this most useful material so as to obtain the best results, we must take into consideration the immense benefit conferred on the community by this useful and inexpensive material; for it is evident, many years must elapse before we find a substitute for it. It is our duty, as long as dentures of rubber are in use, to make this class of work in the best way known to us.

I have seen rubber sore mouths, and I have seen sore mouths from every material used by us. It only requires perfect work from the modeling to the finished plate, and any material will do good service.

I have replaced gold and even continuous-gum by a rubber plate, with comfort to the patient, and no doubt we have seen rubber plates doing good service after many years.

What is the cause of failure in them, and what will give us success?

Failure will result from rubber that has come in contact with oily substances before or during the process of vulcanizing, leaving a soft, spongy plate instead of the dense, horn-like rubber. No heat will dispel the mischief, and the plate will have an affinity for all greasy matter. This will soon decompose, and the rubber sore mouth will be the result. This is no fault of the rubber.

Modeling has much to do with rubber failures. Only the finest plaster should be used, and this should have every attention in mixing.

Do not mix water with plaster, but let the plaster be dropt into the water a little at the time. When a sufficiency is so treated, allow every particle to settle to the bottom, and when every trace of air is gone, pour off the excess of water and a creamy semi-fluid will remain, easily flowing and without air-bubbles,—no excess of water and no plaster devoid of its water of crystallization, thereby making defects in models that prove pits to break into when the rubber is pressed.

Models should not be dried except in warm air, nor used till two days after the casting.

We now have to consider flasking. Small flasks are to be condemned. They should allow of a good-sized model to be placed into them without making it too thin, thus causing it to break in packing or screwing up, and consequently deranging the work.

Scalding out wax is our most important work in rubber cases. Many failures, both in plates and from loose teeth on rubber plates, are attributable to oily wax and paraffine being left in the molds or on the pins and backs of teeth.

Only steam at high pressure can be relied on to displace this enemy to vulcanite.

Our next treatment is keeping the molds hot for facilitating placing the rubber into them and around the teeth; and last, but not least, preparing and heating the rubber for packing.

It is a well-known fact that heated rubber will stick to hot metal. Therefore, if we have our models coated with tin foil and heated, rubber can be packed directly into place and kept there, but while the heat of the flask may be above 220°, rubber is best packed only at about 200°. I have an apparatus to control heat on rubber and models.

If rubber is allowed to be in contact with dry heated air, as in placing it in an oven, it has already begun to take the form of vulcanite, and the particles will not adhere readily, while the resistance of the hardened surface to pressure is frequently the cause of fractured models.

Again, in deep-bite sets, rubber laid on in pieces and only adhering at the edges will not be pressed into a solid form, as the air shut in

will expand and often burst all the plaster casings, shrinkage taking place in ratio, and the workman will wonder what caused the results.

Therefore, while rubber is about the commonest material used in dentistry, nothing claims greater attention at our hands in working out the details to make it a success for dental plates. Like its prototype in office use, amalgam, we cannot exclude it, therefore it is our duty to give it the best treatment possible.

Here are two pieces of work for comparison, a set mounted on gold and a vulcanite one; the gold has only been used a year, while the vulcanite was worn eight, and I think you will agree with me that the inferior material is the best.

While I do not advocate cheap material, or cheap work, I seriously submit to you all, the importance of using our old-time much-abused material in the best practical manner at our command.

PROFESSIONAL FOLLIES.

DR. S. H. KING, LINCOLN, NEB.

In Nebraska Dental Society.

To thoughtful members of a profession resting on the sciences, it is astonishing so many of its readers lead into the realms of folly where ordinary senses and reasons do not sustain them—often mounting a hobby on which they ride into notoriety.

One of the finest of those that confronted me after entering the profession, was the V-shaped separations of the teeth to prevent decay, advocated and practiced by Dr. Arthur and others. I congratulate myself that, tho young and inexperienced, I was not mislead by their fallacious teaching. I could not believe the Creator, in his infinite wisdom, had made such a mistake as implied by such practice. Many comparatively, good, sound, teeth were ruined by this outrage on nature and malpractice. Reasonable application of the knowledge of dental histology would have forbidden their committing such outrages as filing and grinding through the enamel of the teeth at their most salient points, leaving the dentine without protection against the acidulous action of food, to say nothing of its exposure to the ravages of fermentation and decay. It will be remembered this practice was not confined alone to carious teeth, but those perfectly sound were thus treated in anticipation of caries.

Another time-wasting, tedious, and foolish operation was at that time practiced, and is by some to this day. I refer to the filling of root-canals of devitalized teeth with gold. This practice, however, was perfectly consistent with the theory of those highly esthetic aristocrats of the profession whose motto was "gold or nothing," which was

often interpreted by their patients to mean, all the gold they possessed and little in return.

That this practice has been largely superseded by the more practical, expeditious, and common-sense method is a promising evidence of our profession's progress. So zealous were many of these all-gold devotees that they sought to ruin the reputation of amalgam as a savior of teeth, by raising the cry of its mercurial poisoning. This led many a prejudiced and curious investigator, while looking for its bad qualities, to discover its good ones.

It may be proper to remark in passing, that to Drs. Flagg, Chase, and Palmer, the "New Departure" advocates of about fifteen years ago, is largely due the credit for rescuing the large per cent of practitioners who had been captivated by the "gold or nothing" theory, and placing them on the better and more substantial foundation of an eclectic practice.

We are familiar with the recent attempt on the part of a few members of our profession to gain notoriety by introducing the Herbst method of filling teeth with gold. For months it was the leading theme of our dental literature, and not till Dr. Herbst came to this country and attended the American Dental Association, and assured these men that our methods of manipulating gold were superior to his, did they cease to follow this *ignis fatuus*.

During the past five years the bridge-work craze has afflicted many of our profession. No chasm so broad or so deep, but, if they could find a couple of rotten piers on which to erect a beautiful superstructure, they would bridge it over. Or, if no snags could be found for anchorage, sound teeth must yield to the drills, hammers, and other machinery of these zealous bridge-builders till the chasm was spanned.

I would not be understood as condemning this class of artificial substitutes altogether. There is occasionally, but not often, a case presented in which a piece of bridge-work may be very properly inserted, and do good service. But I do emphatically condemn the indiscriminate bridging which has been the practice of some—such, for instance, as setting a full denture upon four roots. Again, the practice of drilling into two sound teeth for the purpose of getting anchorage for a piece of bridge-work should be condemned.

Finally, as touching this question, I think the law of cleanliness and decency will sustain me in making one condemnatory assertion, to wit: *That no piece of artificial denture more extensive than an artificial crown should be made a fixture in the oral cavity.* Had each gentleman present been called on to remove as many of these filth-traps as I have—not one of which had been in position for two years—I am confident there would be no dissent from this ultra rule.

But it is useless to waste more words on a practice which I trust will soon fall into innocuous desuetude.

The dental profession has been standing for months with open mouth and distended eyes, to see whether it should follow Younger, Atkinson, Ottofy, and others off into the barren fields of implantation, implantation of dead bones into living, throbbing tissues of human flesh. And this outrage on tolerant nature is done also in the name of science.

Not many years ago a member of our profession reported his successful replantation of a freshly extracted molar into the flesh-crown or comb of a rooster, where it became permanently attached. As an experiment it was a success, but we never learned whether the bird could masticate his food better than before, neither did the experiment demonstrate any new principle, for plastic surgery has been practiced for more than three hundred years. Neither does the boring of holes into the jaw bones of living subjects and driving therein the dead, dried, diseased, and discarded dental outcasts of another, demonstrate any new principle. For it was long ago demonstrated that even a leaden bullet, shot from an enemy's gun, driven into the osseous structure of the human frame, poisonous tho it be, would become encysted, and its presence tolerated, by the maternal kindness of Dame Nature. But we challenge any one of our professional brethren, who have been riding this outrageous hobby, to produce one scintilla of evidence of a vital union, resulting from this implantation folly. If these would-be leaders in prosthetic dentistry would implant appropriate models of porcelain teeth, constructed for that purpose, and claim for them only what all implanted teeth really are, to wit, mechanical substitutes of limited durability, their patients, who submit to such operations, would feel at least that they were bearing no doubly dead corpses of the dental family from other mouths. I say doubly dead, for notwithstanding these fossils have been laying in the tomb of the departed for months and perhaps years, they are, before their attempted resurrection, treated to a bath of bichloride of mercury—corrosive sublimate—a poison which no known living thing can withstand and live.

It may be a consoling fact that ours is not the only profession afflicted with follies. For example, the medical profession in many communities has recently been humiliated and disgraced by some acknowledged leading member going off after a strange god, bearing the double misnomer of *Christian Science*.

If it be Christian to deceive the already deluded victims of imaginary ills into the belief that they are made whole, and with such a fulcrum impose on the credulity of those really afflicted, with the hope that they too can be cured by such nonsensical gibberish, that we

have measured the first misnomer by the wrong standard. As to the second misnomer, the *science* seems to consist wholly in the mode of raking in the shekels from the poor deluded followers.

It has been truly said that "science is a goddess who is rich in her attributes, ready to reward her worshippers, but coy in her gifts. She is generous only to those who worship at her shrine in sincerity and truth, and who supplement their prayers by continual labor and deeds."

DISCUSSION ON DR. S. H. KING'S PAPER.

Dr. Shriver—The essayist objected to bridge-work on the ground that it could not be kept clean. I take issue with him on this. If properly inserted it can be kept clean as easily as the natural teeth, and the patient should be instructed to brush it as often and as carefully as he would the natural teeth, had they remained. Bridge-work is not so uncleanly as the average rubber plate.

As to durability, time only will decide. I have put in many of them, and can almost say that I have no failures. The work is as permanent as any other kind of artificial substitutes.

The President—Dr. King is certainly much mistaken about bridge-work. I have seen between two or three hundred cases, and I am certain the work will prove successful. We should not condemn it because we have seen failures. Gold fillings sometimes fail, and yet filling teeth with gold is not usually considered a failure.

Dr. H. T. King, Fremont—The essayist left out one folly, and that is the old folly of trying to save all pulps. As to bridge-work, I believe it is as easily kept clean, when perfectly made, as any other work we put in the mouth.

Dr. King, Lincoln—I am in favor of saving a pulp alive whenever possible. Now I have removed bridges that had been put on by the very best bridge-builders, and in regard to cleanliness, I have actually been obliged to hold my nose during the removal. The odor in some cases is unbearable. Besides this, we often have peridental inflammation resulting from irritation in wearing bridges. I advocate removable bridge-work.

Dr. Shriver—I would like to ask Dr. King if the bridges he moved were held on by open bands, or closed crowns?

Dr. King—Open bands.

Dr. Shriver—I condemn them. If we employ removable bridges, it is necessary to first cap the tooth or roots with gold, and let the bridge slide on and off the gold cap.

Dr. Whinnery, Omaha—Nearly all open bands are failures. I think there is a happy medium in the use of bridge-work. In some cases it may be employed with success.—*Dental Review.*

THE BASIS OF TEACHING NOMENCLATURE.—TERMINOLOGY AND EDUCATION.

Paper by W. H. ATKINSON, in the American Dental Association.

"The light of the body is the eye; if therefore thine eye be single, thy whole body shall be full of light. But if thine eye be evil, thy whole body shall be full of darkness If therefore the light that is in thee be darkness, how great is that darkness."—MATT. vi, 22-23.

To comprehend the possibilities and probabilities in functional activities in normal and abnormal instances of growth and nutrition of the bodies subject to those changes, it will be necessary to apprehend the coming into being and behavior of, no less than the degree of susceptibility to, including energy by which strength or weakness of these factors or subjects of function are endowed. In fact, the manner and degree of endowment of functional power is the only proper basis for classification. Function means movement—in condition or of place; condition signifying relation of part to part, and place of being to being. Personality of the identity and the medium in which it exists must be determined to lay the foundations of change capable of being perceived and examined for characteristics by which to discriminate the changes of body in mass and the molecular and volitive changes; the aggregations and correlations of which produce the more obvious mass-motions pertaining to the individuals, and the masses of bodies under examination, so as to congruously catalog them in class, order, genus, species and variety.

Entities, and the media in which they subsist, are now attracting more general attention than at any former period. But these studies are so overloaded with the former bad classification as to cripple our efforts to get at a satisfactory comprehension for the starting-place of the doings of these bodies in a habitat without which they do not appear to sensuous perception.

The mycologists call this habitat "culture-medium," but they do not stop to investigate the intrinsic massing of primal elements (atoms); the appeasing of the hunger of which, sufficiently to afford lodgment and support for the ferment bacterium capable of propagating the molecular changes which constitute the feeding of the ferment-body by the fermentable medium,—be it a fibrinous, albuminous, or hydro-carbon form of digestive activity of the medium,—is effected. From the time of Jenner, this question of well or poorly elaborated medium has been more and more pressing for satisfactory solution by the leading physiologists. Jenner noticed that only a part of those who milked the cows afflicted with "the pock" were infected so as to have the ferment set up the fever in the juices of the flesh, which was the culture-medium for the micro-organism without which the pock-fever did not appear. He further took note of the fact of the immunity from infection of the

variolus virus which these people enjoyed. But he did not seem to follow out his reasoning on the *non*-appearance of the pock in the rest of the milkers.

Had he taken this into account, would he not have been led to conclude that those who did not take the fever had such a well-elaborated medium as not to afford lodging or support to the infection with which they came in contact in milking equal to those who took it? Infections, impregnations, and contagions are only capable of "taking" where ripeness of protoplasmic churnings have developed affinities in the magma of "infectible"—"pregnable,"—or susceptible bodies so as to effect new combinations in the molecular mass, which is then the "culture-medium" in which the seminal impacts work out their fermentative or putrefactive mission.

Where the awakening and engagement of bonds of affinity in atoms takes on the fermentative form of molecular metamorphosis old molecules are broken up and new ones of variable complication occur.

Thus molecules of variable stability are formed in which the urge ovaries from the fermentable body in which the (boiling) fermentation took place. So that these are less susceptible to incoming impact on the one hand, and on the other more easily aroused to new activity in the more complicated plasmic mass which they form under typal guidance, of cosmical, planetary, or individual radiant aud irradiant impact into ether, air, vapor, water, colloid, and solid bodies constituting the lay-out of the field of our study of function (doing).

The order of functional procession is: 1st, Cosmic; 2d, Planetary or Earthy; 3d, Aerial; 4th, Combustive or Fiery; and 5th, Aqueous or Watery—processes, the interpenetration and mutual modifications of which are so as occult as to render it difficult of apprehension and statement so as to meet the demand of materialistic scientism.

All these processes and the bodies thus brought within the range of sensuous perception are embodiments of power, the measure and the modes of which mark their differentiations and mutations that constitute anatomy, physiology, pathology, metamorphosis, restoration and destruction, so important for us to comprehend and formulate as the only effective basis of study for practicalization of our chosen calling in life!

In the human being any impact or epact capable of cognition by the senses may be the inception of polarization, depolarization, acceleration, retardation, or arrest of current in the elaboration of function.

As function is effecting of the purposes of being in currents and counter-currents involving demand and supply of the adequate energy, we are led to the contemplation of "stato-motism" or polarization as the basis of cosmical, planetary, and personal movements.

Stato-motism in the cosmical plenum of molecular mass may be said to stand as the coiled tension or potential energy in mind and substance ever ready and ever operating cosmical, planetary, and personal rounds of perpetual activities ! !

Statism (stand still) and motism (the go-on) are alike the first postulate (the atom), capable of being fully comprehended only by a sort of fictional compromise in statement, as each has two aspects of presence like the atom, the name of which is no longer tenable, when we closely study molecular constitutions.

So the emotism of solar fullness is a sort of statism till it springs into motism at the demand of planetary voidness as statism asking to be infilled with radiance, which now gives it motic character, and thus we readily see that our definitions are not finalities except as to statements of relation of numbers. These are eternal verities ! Such as " the whole is the sum of all its parts "—to wholly understand a part its connections must be comprehended. A complete survey of all the connections of a part will lead in the end to a comprehension of the whole.

Let us then endeavor to follow the alternations of deficiency and sufficiency, or emptiness and fulness, of the receptacles in which the discriminative measures of power are stored, and learn that they are but infinitesimal repetitions of movements between cosmic fulness and planetary voidness in chaotic masses, by which all forming and feeding of individual bodies are produced and maintained. May we not readily see that a key which opens any department of the beautiful house we live in, will unlock, with the requisite modifications, the entire macrocosm of which it is an accurate microcosmic representation ?

This key is a knowledge of the metamorphoses of prime elements in combinations and separations which are known as atoms.

Movements of atoms result in their change of place and change of character. In the first instance they are moved in mass in space and moved apart or nearer together without combination or coherence; in the second instance they are formed into new bodies by arousing inherent or communicated measures of affinity, or bonds of energy, by which they interpenetrate each other, and forming new bodies take the name of molecules. Of these there are two forms or sorts. The first is when the awakened bonds of combining power are in atoms of the same character; the second is where atoms of diverse nature are within the sphere of influence when their bodies are awakened. The first form consists of oxygen, hydrogen, carbon, or other primal gaseous body, which is now called nascent or ready to be born into the molecule, properly so called, of at least two diverse molecules of the first or preparatory order of holding together atoms of the same class.

The degree of strength of the grip holding elements in combination is the measure of permanency or evanescence of the body so composed.

A good example of this strongly held and loosely held element is shown in water H_2O and peroxide of hydrogen H_2O_2. In the latter the extra equivalent of oxygen is so loosely held as to demand quiet and a temperature below 65° Fahr. to prevent spontaneous dissociation of the loosely held oxygen, leaving the water molecule of H_2O in the liquid state in the bottom of the chamber in which it is held, while the oxygen in gaseous form occupies the upper part of the chamber.

This is the *a*, *b*, *c* of function, and when exhaustively studied gives us the means of comprehending healthy and unhealthy models of expression which are nominated disease in the text-books extant.

Instead of scanning down to the lowest and simplest forms of disturbance, which reveals the changes in prime and proximate elements, the whole system and its parts in regions and in organs have been made the territory in which have been sought explanations of the changes involved in physiology, pathology, and cure.

Physiology is the full and direct play of currents of affinity, thus producing strong and well-formed molecules, of which healthy bodies are constructed which operate all the functions with *ease;* while pathology is the minified, deflected, and split currents of combining energy, producing unstable and weak molecular mass, thus inaugurating *dis*ease in the very elements of the tissues and organs composing the functioning body. Anything which arrests retrogressive nutrient action, and promotes progressive nutrient activity, is a therapeutic agent or *cure.*

M. D. and D. D. S.—I do not agree with many that it is so essential that dentists should have the M. D. degree. My opinion is that we can practice separately under the D. D. S., and with as much satisfaction as we can under the so-called higher degree. From an experience of a quarter of a century in teaching, I am led to believe it is hardly possible to make good dentists out of medical men (applause). It is an error, in my opinion, to suppose that we can begin a practical education at the top, when a man has to acquire an education of the fingers as well as an education of the mind. If he begins at the top of the ladder he will never go down to the lower round satisfactorily. Such is my experience with all medically-educated men; they seldom make what I call good dentists. I do not say it is impossible. It will depend largely on the character of the individual, but as a rule, medically-educated men cannot come down to details in practical and mechanical things.

WHAT VARIATIONS IN THE MANNER OF USING TEETH ARE EXHIBITED BY VARIOUS ANIMALS INCLUDING MAN.

F. S. BUCKLEY, W. OF M.

The present paper included the teeth of batrachians and reptiles and three mammalian orders, edentates, cetaceans and ungulates. Among the batrachians, the frog has only one row of simple pointed teeth on the upper jaw; the lower jaw is endentulous. These are merely prehensile teeth and not masticatory. The toad is edentulous, seizing the beetles, caterpillars, slugs, etc., forming its food, between its jaws and sometimes use its fore paws to push the struggling insects down its throat. The frog and toad simply swallow the animals used for food; with the toad they usually reach the stomach uninjured.

Among the reptiles the tortises and turtles have no teeth, but are provided with horny cases on the margins of the jaws, sharp-edged in carnivorous, and blunt-edged in herbivorous species.

The lizards have conical teeth, sharp and pointed in some, and rounded in other species; these teeth are, however, always used in seizing the insects used as food. One lizard, the New Zealand Hatteria, uses the margins of the jaws as a masticating surface after the teeth are worn down. This is one of very few instances where bone, uncovered by any dental tissue, is used for mastication.

Snakes may be divided into venomous and non-venomous. The non-venomous snakes have two rows of teeth on the upper jaw and one row on the lower jaw, sharp, curved teeth, pointing inward and backward, and firmly anchylosed to the jaws. These are used precisely as the teeth of the fishes, for *seizing* the prey, aud in no sense for masticating purposes, the animal being swallowed whole and alive, of whatever size or shape. The boaconstrictor and anaconda, however, squeeze large animals to death before swallowing, which is accomplished by advancing first the lower jaw, then the upper, and thus forcing itself over the body of its prey. Among the venomous serpents some have poison fangs constantly erect and only slightly longer than the other teeth, but the viper, adder, rattlesnake and others have very highly specialized poison fangs. These are very long and curved teeth, and lie flat along the roof of the mouth when not in use and are only erected when the snake strikes. When this occurs the contraction of the muscles of the face causes the huge poison glands to be compressed and the secretion to flow out at the base of the poison fang from which it is directed into a canal in the tooth by a fold of mucous membrane surrounding its base, and discharged through the opening near the apex of the tooth while plunged into the flesh of its victim.

Crocodiles and alligators have large, sharp, conical teeth used only for seizing and tearing their prey, which is not swallowed whole as in

serpents and fishes, but ofted consists of very large masses of flesh which are torn into pieces of convenient size for swallowing.

Snakes and lizards have sharp conical teeth when in the egg shell, developed only for the purpose of cutting through the shell, and are lost soon after the exit of the animal. Crocodiles use the hard snout for this purpose. Among the extinct reptiles are many very peculiar varieties of teeth whose especial use is only imperfectly known.

Existing birds have no teeth but use horny bills or beaks for the same purposes. However, if it were possible here to consider the teeth of the several very peculiar species of extinct birds as they may be studied from fossil remains, we should find several species with true teeth. These are reptilian in character and indicate clearly the carnivorous nature of the food used, as well as the fact that these birds use their teeth only as prehensile organs, and in no true sense masticate their food.

The mammalian teeth are of the highest structure and have the most varied uses. Excepting the edentates, mammals have four kinds of teeth in the same mouth, each having a special function to perform; whereas we have seen that all animals lower than the mammals have but one kind of teeth.

The edentates have simple conical teeth for seizing and tearing all kinds of food, animal and vegetable, excepting the South American ant eater, which, in the absence of teeth, uses its long tongue, coated with a viscid secretion, as a prehensile organ.

Among the cetaceans the dolphin has about two hundred slender, sharp, conical teeth for seizing its prey. The sperm and bottle-nosed whale have small, regular, almost rudimentary teeth; the whalebone whale has no teeth at all, but entangles the small marine animals forming its food in the fringes of the whalebone plates, and then sweeping them into the throat with the tongue—swallow them. The narual has a very peculiar tusk form ten to twelve feet long in the upper jaw on the left side. The right tusk is buried in the jaw bone. These are the only teeth of the narual and the long tusk is probably a sexual weapon.

The ungulates, or hoofed animals are all herbivorous and have teeth conforming closely to the mammalian type and modified according to the different vegetable forms on which they subsist. The grinding surfaces of the premolars and molars have complex patterns formed by the enamel dipping deeply into the crown and preserving constantly a roughened surface for trituration, because of the unequal density and resistance to wear of the enamel and dentine. The cuspids and incisors are often used as weapons and as prehensile organs.

The existing odd-toed ungulates, comprising the rhinoceros, tapir, and horse have four premolars and three molars of large size and com-

plex grinding surface, presenting probably the most perfect triturating surface among living animals. The cuspids are stunted because of their slight use and are absent entirely in the rhinoceros. The incisors are prehensile organs for biting off grass and herbs. Those of the horse are very large and strong, meeting end to end, and therefore wearing down rapidly. Instead of having enlarged cuspids in the shape of tusks, like the wild boar, the horse uses its very strong incisors as weapons.

The existing even-toed ungulates, comprising the hippopotamus, camel, sheep, ox, antelope, and deer, have molars used about the same as in the horse, etc. The incisors vary greatly in use. *

The wild boar has large cuspid tusks used as sexual weapons. In the male Sus barbirussa the upper canine tusks grow to great length, pierce the upper lip and curve backward toward the eyes, Their use is not clearly understood, tho evidently a sexual organ, but are not much used in fighting, and they have been known to grow directly into the head of the animal.

The hippopotamus uses its incisor and canine tusks for uprooting aquatic plants which it eats, and also as weapons of offense.

The sheep, ox, and antelope have no canine teeth using their horns as offensive and defensive weapons, but there are three species of deer which have large canines, apparently because of the smallness of their horns. In fact, it seems to be a rule to find canines developed among the deer when sufficient protection is not afforded by the horns. The incisors are absent in the upper jaw, the animal being unable to bite, but tear off the blades of grass by a peculiar movement of the head. The existing ungulates are only a small proportion of those once inhabiting the earth which possessed very interesting and peculiar teeth, whose uses are, however, very little known.

The orders of the animal kingdom which have not been considered in the preceding part of this paper are the sirenia, proboscidia, rodentia, carnivora, insectivora, chiroptera, and primates, which latter includes man.

The only two animals of the order sirenia are the dugong and manatee which present one great variation in the use of their teeth, in that they do not use them at all. The dugong has eight or ten, the manatee twelve rudimentary incisors and cuspids buried in the lower jaw and covered in with horny plates. These are distorted and stunted teeth which are never erupted and are eventually absorbed. However, both animals have good molars for masticating the seaweed and aquatic plants on which they live.

The proboscidians, comprising the elephant, mastodon, and dino-

* Cattle have no upper front teeth.—ED. ITEMS.

therium, of which, however, only the elephant is now living. Its dentition is peculiar to itself. The two incisor tusks projecting from the upper jaw are the only teeth anterior to its molars, of which it has only one in use at any time on each side of each jaw. These tusks are usually sexual teeth, tho' the female of the African elephant has as large tusks as the male. They form the weapon of the elephant in defense and attack; they are also used in uprooting grass, which is roughly shaken before being taken into the mouth to remove the adherent earth. The molars, of the ungulate type, are kept uneven by the constant trituration of grass and roots thus mingled with earthy matter.

The elephant also bites off the limbs of juicy succulent trees and eats them without using its tusks. Tame elephants use the tusks for many purposes, as for instance, in pulling a rope, the rope is passed over the tusk and then seized between the molar teeth to give a purchase.

The rodents present variations, especially in the use of the incisor teeth, of which they have only four, two in the upper and two in the lower jaw, very long, strong persistently growing teeth. The articulating surfaces of the lower jaw are very long antero-posteriorly, and permit a very great backward and forward motion as used in gnawing. The molar teeth vary according to the nature of the food used, whether animal, vegetable, or a combination of both. The beaver illustrates the uses of the incisors of the rodents. They will gnaw through a tree eighteen inches in diameter, and then drag such portions of it as they cut off to their dams, and filling it with brush and earth, form a secure dam to running streams. They also dig and gnaw away earth and roots, forming a canal to transport their timbers to the refuge pond where they live.

In the carnivora the cuspid teeth are those especially developed and the incisors uniformly small. The molars are also multi-cuspid and more like many cuspid teeth than molars. The result of this conformation is that the animal food is seized, torn and swallowed in chunks and masses of flesh. No mastication is really effected, and a dog will swallow the mass of meat given him as rapidly as he can tear it into pieces small enough to pass the throat. This is the general use of the teeth of the carnivora, while in all of them the enlarged cuspid teeth are the principal weapons of offense.

Some, however, eat vegetable food as well as animal, and hence we see in the bear true masticating surfaces on the molars to masticate the berries which it consumes as part of its food. Among the seals the walrus presents the greatest peculiarity in its upper canines, which are very long and pass down far below the lower jaw. These are used both in the male and female in clambering over ice, and tearing up marine plants and turning over obstacles which prevent their seeing

the crustaceans upon the sea bottom. They are also the weapons of the walrus.

Insectivora have multi-cuspid molars and, in general, teeth adapted to seizing and tearing the small insects forming their food.

Among the chiroptera the vampire has only one incisor on each side of the upper jaw with which the wound is made, and its molars are stunted as we should expect in an animal living only on blood.

The teeth of the monkey are much like those of man, comprising all the kinds of teeth necessary for mastication where a mixt diet is found. There is no especial variation in the teeth or manner of using, but the cuspid teeth are enlarged in the male, almost forming a sexual weapon.

The teeth of man are the most perfect to be found in the anima kingdom, and have the most varied uses. In eating, the teeth of man are adapted for both animal and vegetable food, and are evidently intended for thorough work in masticating hard foods and meats. The manner of the articulation of the upper and lower bicuspids and molars enables these teeth to reduce the solid food to very small particles prior to its entrance into the stomach. As a weapon, the teeth are not used except in a state of deepest barbarism, and where brutal passion overrules every suggestion of reason and judgment; in short, the teeth and nails are only used when man becomes a mere animal. The teeth o man are not used as prehensile organs, the hands and fingers conveying the food to the mouth. Man is the only animal which uses the teeth for other than their appropriate uses.

While the uses of the teeth of all other animals are clearly defined and adhered to with the simplicity of the animal instinct, the reason of man, perverted and warped to suit his abnormal desires, indicates the most peculiar and absurd uses for the teeth, so that we find men using the teeth in a variety of ways, which are sometimes simply amusing, sometimes very injurious.

The teeth of all animals doubtless discharge the function of giving their share of expression to the face, but this use of the teeth is hardly thought of in connection with any animal but man, for no other animal as frequently loses its teeth and thus destroys the normal expression of the lower part of the face completely. Often, man's teeth indicates clearly the immense importance of the teeth in giving expression to the face.

Probably the highest use of the teeth of man is that of assisting in the articulation of sounds, in words, as the expression of thought and motion. Man uses the teeth, mouth, throat, and vocal organs in this process of speaking, and this is the distinguishing characteristic which separates man from all other members of the animal kingdom. *Dental Register.*

EFFECTS OF MENTAL OVERWORK.

A COMMON FORM OF ILLNESS WHICH IS GENERALLY DISREGARDED.

Editorial in *Lancet.*

Some interesting, tho not novel, observations on the symptoms of mental fatigue were discussed at a recent meeting of the Anthropological Society. The result of these investigations goes to prove that weariness of mind, the result of work, like other forms of exhaustion, is recognizable under the two different tho related aspects of irritability and incapacity. Further careful inquiry into the same subject would probably show that here, as elsewhere, the former of these conditions is introductory to the latter, and is the natural sequel to that stage of apparently successful overaction which is seen when an organ, still fully capable, is unduly stimulated.

The observations referred to were culled from a series of reports by school teachers, and included details of their own sensations, as well as of the children under their care. The signs of mental irritability were apparent in sleeplessness and nervous laughter; of fatigue, in sleepiness and incapacity for task work. Lolling, yawning, and a languid manner told that the will was flagging. Headache suggested overstrain in study combined with defective ventilation, and perhaps a too sparing diet; while some curious facts bearing on the causation of color-blindness and somnambulism were also noted. Thus, in one case, the blue color perception was for a time obliterated, and the sufferer from this defect found herself painting ivy leaves a bright orange; while in another, a student having retired to rest on the eve of an examination, awoke at his desk to find that he had been busily engaged in drawing humorous cartoons relating to a former conversation. Here we have an instance of cerebral irritation due to overwork which suggests a somewhat close connection between dreaming and somnambulism, and affords a clue to the physiology of the latter condition.

Overwork, both mental and bodily, is at once the most general and the least regarded form of illness to which we are liable in the present age. Do what we may, it is next to impossible to escape from it; but there is, at all events, a certain satisfaction in being able to recognize its features. We must not forget, however, that it is also to a considerable extent a preventable evil; and it is certainly a matter for satisfaction that this fact is not ignored by the reforming party in the legislature. Its treatment in individual cases requires chiefly that proper attention be paid to the two great essentials of timely rest and wholesome diet. Work, however irksome, may, it is generally allowed, be undertaken on a liberal scale, if only it is not too continuous, but broken by timely and adequate intervals of rest. The value of a plain and liberal dietary is hardly less, and we may take it as a maxim for the times that, so long as appetite and sleep

are unimpaired, there is no dangerous degree of overwork; and, conversely, that a failure in either of these respects should be regarded as a warning signal, to which attention should be paid by relieving the strain of exertion.—*Lancet.*

IMPLANTATION OF TISSUE.

REPORTED TO THE AMERICAN DENTAL ASSOCIATION BY DR. T. W. BROPHY.

REPORT OF TWO CASES IN PRACTICE BY DR. JOHN S. MARSHALL.

During the last twelve months the science and art of surgery have made marked advancement, demonstrating that the possibilities of surgery cannot be foretold.

Among the operations chiefly attracting the interest of the oral surgeon is the transplantation of tissues. In the human subject, these operations have recently been carried to an extreme previously unknown, and transplantations from the lower animals to man are practiced to an extent which gives us hope of attaining results in surgery not hitherto contemplated.

At the recent Congress of German Surgeons, Wolfler, of Gratz, advocated transplantations of mucous membrane, as he regarded such operations of great value. Dr. Wolfler successfully transplanted mucous membrane from a collapsed rectum to the conjunctiva in a blepharoplasty, and in numerous cases successfully transplanted mucous membrane from frogs, pigeons, and rabbits.

During the month of April last, Dr. C. Fenger, of Chicago, transplanted successfully mucous membrane from a rabbit to a man in blepharoplasty.

Dr. Gersung, of Vienna, assistant to Prof. Billroth, has recently performed a novel and interesting operation,—the transplantation of nerve from the rabbit to man, his patient being Prof. von Fleisohl, the distinguished occupant of the chair of physiology in the University of Vienna. From a surgical stand-point, this remarkable operation has so far not only been conspicuously successful, but the function of the nerve has to a marked degree been re-established. Sufficient time, however, has not elapsed since the operation to determine whether complete sensibility will return to the fingers, the parts which were anesthetized from loss, in consequence of neuroma, of their sensory nerves. The favorable results, two months after the operation, indicate that a complete restoration of function may be expected.

Equally interesting in this line of surgery is the operation for the transplanting of a rabbit's cornea to the human eye. At the Eye, Ear, and Throat Department of the Presbyterian Charity Hospital, of Balti-

more, Dr. Julian J. Chisholm has recently, as he announces, successfully performed this operation. The patient was a healthy man aged thirty-five. Three years previous to his admission to the hospital, he had lost the sight of both eyes from the effects of caustic lime. As a result of this accident, there was union of the eyeballs to the eyelids, or symblepharon. Sloughing of the surfaces of the conjunctiva ensued. The eyes had been operated upon, and the lids separated from the cornea, yet the cornea remained opaque, with no indication of becoming clear, and upon its surface was a thick layer of granulations. Hopelessly blind as the patient was, Dr. Chisholm performed that wonderful operation devised and introduced by Prof. von Hippel, of Geissen, Germany. The operation, performed by the use of Van Hippel's cornea terphine, consisted in the insertion of a clear piece of a rabbit's cornea into an opening made for it through the opaque human cornea. The minute details of this delicate operation I will not describe, as it is sufficient for our purposes to note the result. By use of the trephine named, the opaque cornea of the patient's eye was removed, and with the same trephine a duplicate plug of the rabbit's cornea was removed and carefully inserted in the opening made in the center of the human eye. The parts were dressed with compress and bandage, which completed the treatment. In a few days the graft became adherent as in skin-grafting, and a little later the sight of the patient was restored.*

Through the use of cocaine, no pain was experienced by the man, nor exhibited by the rabbit.

It is unnecessary to state that iris, pupil, lens, and retina must all be in good order that benefit be secured. This new operation will bring relief to many hitherto considered hopelessly blind.

Noting the success attending the transplanting of different tissues of the body,—skin-grafting, long known and successfully practiced; transplantation of bone, or bone-grafting; transplantation of mucous membrane from man to man and from rabbit to man; transplantation of cornea from rabbit to man,—awakens in us the hope that in the near future staphylorraphy and kindred operations may be enumerated among those surgical proceeedings which, when necessary, will appropriate sufficient tissue from the lower animals to insure successful performance.

Dr. E. C. Kirk, of Philadelphia, in a classical paper on the subject of implantation of teeth, based on his experience extending over two years, during which time he performed the operation thirty times, states that all the cases were successful but three. Two of the three

*A later report of Dr. Chisholm's cases states that the operation was not ultimately successful.

failures were in one mouth, the patient being affected with a specific virus. The result of these experiments leads the author to the conclusion that attachment in favorable cases is by bony anchylosis. The two points especially to be guarded are first, the selection of cases from which catarrhal conditions are absent, and second, the avoidance of all influences which tend to marked inflammatory action.

In the opinion of Dr. Kirk and others, the prognosis of these cases seem favorable, if antiseptic measures be faithfully observed and practiced during operations.

While such tissues as mucous membrane, nerves, etc., are, under antiseptic precautions, successfully transplanted, we cannot regard the conditions following such operations as analogous to the implantation of teeth.

In bone grafting, the newly-grafted bone does not become the substitute of the part it is intended to replace, but furnishes a nucleus around which new bone is formed, and the grafted pieces are removed by a process of absorption. Such also is the case in skin-drafting, sponge-grafting, etc.; and our observations of implanted teeth which have failed show that absorption also of their roots has taken place. When these other substances are placed in position, immobility may be maintained,—they are not subject to external disturbances. Not so with the teeth: they are always exposed to irritants from without. If, therefore, the teeth implanted be fixed by anchylosis, their early destruction, it would seem, must in the absence of the pericemental cushion result from shock, even tho absorption of their roots should not occur. As to whether implantation shall become a standard operation in oral surgery remains to be determined.

It has been demonstrated that the resection of the inferior dental nerve may be accomplished so as to avoid its redevelopment and reunion, if the segment of bone displaced to expose the nerve be returned to the opening with the periphery of the bone plug placed inward. The object of inverting the plug is to close the inferior dental canal.

While distinguished gentlemen in Europe have accomplished much and contributed largely to the fund of information in this department of our practice, the achievements of Prof. Garretson as an oral surgeon have not their equal in the annals of our professional history. His operation of removing the superior dental nerve at the foramen rotundum must take its place among the most skillful and important operations in this department of surgery.

There are thirty dental schools now in the United States, and yet there is room,—that is at the top,—for one more that shall throw aside many old methods and adopt new methods.

THE LIFE AND STRUCTURE OF TEETH.

PROF. FRANK ABBOTT.

In American Dental Association.

It is not a little gratifying to us that, while the practical work of our specialty has reached such a high degree of perfection, the scientific or theoretical part has by no means been neglected. The efforts made in the last ten years to elucidate the minute structure of the teeth, their histology and pathology, have resulted in obtaining much practical useful knowledge. I will, I feel sure, be pardoned for calling your attention to this most interesting and instructive branch of our education, as it has occupied nearly all of my leisure time for the past ten years. The new views and actual knowledge obtained, based on microscopical research, are so utterly at variance with those held previously, that I deem it not only justifiable, but advisable, to bring them before this erudite body, tho only in a condensed form. One can, unquestionably, be a good practitioner without possessing more knowledge of the anatomy of the teeth than that they are built up of dentine, enamel and cement, representing the hard tissues, and soft pulp and pericementum; but I doubt if any practitioner can aim too high in his efforts to become acquainted with the intrinsic construction of the tissues of the organs he is so constantly operating on. Does any one doubt that teeth are living organs, and as thoroughly nourished as any others of the body? We see them originating, and trace their development from the sixth week of embryonal life to the end, in both the temporary and permanent sets. We study, with the naked eye, their anomalies in number, color, consistence and shape. From personal experience we know operations on the teeth are extremely painful. Sensation is a property of living tissue only, and this alone will suffice to prove to an unbiased mind that the tissues of a tooth—particularly the dentine—are endowed with properties of life. Where is this life located?

It is plainly understood by every one that neither the lime salts nor the matrix—the glue-yielding basis substance—can be the seat of life. Consequently, in the old methods of preparing specimens—drying and grinding—no signs of life were discernible; nothing but a lifeless framework of a tissue once full of life was to be seen. Fortunately, those old and, as we now think, almost useless methods are fast dying out, and being replaced by more modern and rational ones: viz., those which aim at preserving intact all the organic portions of hard tissues, of whatever nature.

The knowledge obtained by the older writers was through these old methods; and, unfortunately, the conclusions they arrived at are

still endorsed by many, not in this country alone, but in England and Germany, countries considered the cradles of histology.

The proper manner for obtaining an insight into the intricate structure of dentine and cement is to keep the specimens perfectly wet while they are being prepared. To do this, immediately on the removal of teeth from the mouth, they are placed in a solution of chromic acid, which dissolves out the lime salts and preserves the matrix—basis-substance—and its contents without material change. By this method, C. F. W. Bödecker succeeded in demonstrating, ten years ago, that the contents of the dentinal canals, known as "Tomes's fibers," are formations of living substance. This he emphasized by the use of staining reagents, such as solutions of carmine, chloride of gold, osmic acid, etc., by means of which living substance in other tissues is rendered distinct from adjacent parts. The conical offshoots emanating from the periphery of the dentinal fibres, were shown to penetrate light spaces in the basis substance, which forms a net-like arrangement throughout the dentine; thus demonstrating almost to a certainty that the whole basis-substance of the dentine is pervaded by living tissue. The certainty of these conclusions has finally been reached by new methods, adopted by William Carr, of New York, who, at his early convenience, proposes to lay the results of his studies before the profession. The dentine, therefore, proves to be analogous to other varieties of connective tissue, as bone, cartilage, etc., in accordance with the views announced in 1873 by C. Heitzmann.

In this view, not only the so-called cells and their offshoots, such as the dentinal fibers, are the centers of life, but the whole basis-substance, hitherto considered inert, as it was a product of secretion of the cells—is proved to be endowed with properties of life, or, speaking more concisely, traversed by living substance. In Europe there is but one authority in the line of microscopical research, namely, S. Stricker, of Vienna, who has fully adopted the view. It is, of course, in very pronounced opposition to the cell theory. Many botanists, however, both German and English, have of late conclusively proved that the so-called cells of plants are by no means individuals, but are all interconnected by offshoots traversing the basis-substance—known in plants by the terms cellulose, cement-substance, etc.—thus establishing an uninterrupted continuity of living substance, from the most remote points of the roots to the very tip-ends of the leaves, the same as Heitzmann claims exists in animals.

The so-called bioplasson theory having been established as regards the structure of dentine, bore fruit almost immediately as regards the pathology of this tissue. It was shown in 1879, that in the process of caries of dentine—provided a living tooth be affected—a re-action

takes place which we know as an inflammatory process in bone tissue, and, tho several microscopists have contradicted these assertions regarding the process of caries, attributing the destruction of teeth by this process to the invasion of micro-organisms and the chemical changes brought about by their presence, without any participation of the living dentinal tissue, I still hold to the same views as then announced, with no material modification, after having repeatedly reviewed the ground then gone over.

The formation of secondary dentine, which is partly a physiological and partly a pathological process, has been elucidated by Bödecker, who has also demonstrated the process of primary inflammation in dentine, called by him ebonitis. He demonstrated that in this process a reduction of perfected dentine into its embryonal condition takes place, and that from this, in turn, a new tissue, osteo-dentine, arises. This is of the greatest importance to the practitioner, since it is the outcome of every irritation caused by the carious process, and since it is stopt or brought to a stand-still by the sealing of cavities—by filling—from moisture, particles of food, micro-organisms, etc.

Another important portion of the tooth, certainly to the possessor, has been the occasion of more discussion as to its structure, than even dentine, viz. enamel. For a number of years it has been a mooted question whether enamel is a mere deposition of lime-salts, or a tissue supplied with life and nutrition. Bödecker demonstrated, in 1878, that there are interstices between the enamel prisms, and that these interstices hold extremely delicate fibrils of living substance, beaded in appearance, and sending offshoots into the prisms themselves, causing he transverse striations of the prisms, called after their discoverer the "stria of Retzius." The square fields caused by these transverse striations were shown to hold a delicate, light reticulum, also supposed to contain tenants of living substance. At that time it was proved, on two of my own specimens, that, after a complete decalcification of the enamel, a distinct frill or reticulum is left, similar to that in any other variety of basis-substance, a portion of which was no doubt living structure. The great difficulty in studying the minute anatomy of the enamel lies in the fact that we cannot soften it sufficiently to admit of its being cut. We must, therefore, resort to a process of grinding, which we do, taking the precaution to keep the tooth, from the time of its removal from the mouth, till the mounting of the specimen produced, under water. If a thin slab of enamel be deprived of its lime-salts by means of a six per cent. solution of acetic acid, a gradual dissolving of the prisms is observed, and the subsequent treatment with chloride of gold affords excellent means by which the presence of living substance in this tissue may be demonstrated.

I am, therefore, after ten years of careful study, thoroughly convinced that enamel is possessed of living tissue, tho the amount is very small. This conviction, I am sorry to say, is shared by but few microscopists as yet, but I am always hopeful, and believe the time is not far distant when it will be generally received as a settled fact.

The pathology of this tissue likewise furnishes strong proofs of its life. This I have demonstrated in the process of caries, where a partial reduction of the enamel into its embryonal condition takes place. I have further demonstrated that pigmentation (incomplete calcification) of this tissue shows a distinct reticulum, and that stratification, anomalies in the course of the prisms, excess of club-shaped spaces, etc., are the result of faulty development, and, as such, prove the life of the enamel-tissue.

The third hard tissue, the minute structure of which has been elucidated within the past ten years, is cement. Bödecker found it identical with bone-tissue in every respect: its lacune and canaliculi hold formations of protoplasm, partly living, and the whole portion known as inter-cellular, or basis-structure, contains living substance, the same as other bone-tissue. In necrosis the shrinking of protoplasm is a characteristic feature of the death of the tissue. In cementitis the cement-corpuscles, as well as the basis-substance, break up into medullary or inflammatory corpuscles, after a complete dissolution of the lime-salts; the final result being either an augmentation of the tissue resulting in a so-called hyperplasia, hyperostosis, or a disintegration into pus-corpuscles, with a variably complete destruction of the cement, such as we see in long-standing pyorrhea alveolaris and alveolar abscess.

Similar results, as to final destruction of the cement, appear to be present in the absorption of the roots of the temporary teeth, the granulation-tissue appearing to grow into the cement, taking the place of the lime-salts which have been removed by the physiological irritant. In connection with the development of the cement, many anomalies are known to occur, which I have attempted to bring into a system.

An important outcome of my studies is an overwhelming evidence that, whatever the anomalous shapes, or to what extent this tissue may be augmented, it is still filled with the living substance. This is, in our conviction, continuous, both in its physiological and pathological conditions, with that of the pericement on the one hand and that of the dentine on the other. Even tho the pulp be destroyed, an amount of vitality is left in the cement, nourishment being furnished it through the pericement. This accounts for the fact that a pulpless tooth may be retained and be useful almost indefinitely, provided it has an opponent.

POST-GRADUATE INSTUCTION IN PROSTHETIC DENTISTY.

The above named school has been established by Dr. L. P. Haskell, president; Dr. M. Stout, secretary and treasurer, and Dr. G. F. Schaffer, superintendent. In response to a letter of inquiry by the editor to Dr. Haskell, he has written the following as being among the objects of the school:

"In reply to your letter of inquiry, I will say that the school is strictly one of 'technics,' as our circular indicates. There will be no lecture courses, no *classes;* but the practitioner can come at any time and spend what time he can spare to obtain the practical knowledge of prosthetic dentistry, in which so many are deficient—at least in mental work—including crown and bridge-work. I shall give the students my personal attention. Crown and bridge-work will be taught by one of the best instructors in the city.

The school was the outcome of the establishment of a large laboratory for doing first-class work for the profession, affording an opportunity for seeing practical cases made according to the highest standard, and of all kinds of work. I will be pleased to have you call and see our arrangements. Yours truly, L. H. HASKELL."

Dr. Haskell's long experience as a practical worker in all the departments of prosthetic dentistry, and his career as a teacher in dental colleges fits him in a peculiar manner to be successful in this undertaking. We wish the school abundant success.—*Dental Review.*

Is M.D. a higher degree than D.D.S.?—Dr. W. H. Morgan, of Nashville, Tenn., says: The assumption that the degree of M.D. is a higher degree than that of D.D.S. is an error. The medical schools in the city of Louisville and the schools generally in this country require two courses of instruction. Sometimes they put on a year's study, but they often do not investigate, so far as my knowledge goes, to see whether the student has studied a year before he enters college or not. At the end of two courses of five months each he gets his M.D. How is it in the dental schools? I believe there is not a single one in the country now that is of conceded reputation that does not give at least two courses of instruction of five months each, and I think their students are as faithfully taught as are those in any medical institution. The time of the students is as fully occupied, and they enter into their studies with as much earnestness as do those in the medical colleges. As a class, dental students are more earnest, more energetic, and more enthusiastic in the pursuit of their studies than medical students.

Another point sometimes harped on, that dentistry is a trade and medicine is a science. Is not mechanics a science? Is it not the equal of any other science in the world? Is it not more positive than any of

the sciences that are taught in medicine, except chemistry? Is not the man who can calculate the strength of a column and the weight it could bear as much a scientific man as the man who would give you a dose of calomel and tell you it would operate on your liver, but he did not know how? The fact is the science of mechanics is one of the highest in the world, because its truths can be demonstrated, while medicine as it is taught, is to a large extent, a science of unascertained truths based on theories that are plausible but not demonstrable. I have as high an appreciation of the medical profession as any man in this country; but medical men all know that these are facts, and I wished to disabuse the mind of the idea that every man who is a mechanic is a lower order of man than the man who pretends to understand medicine, and to claim for the scientific man in mechanics as much as can be claimed for the scientific man in other branches of science.

Origin and Growth of the Teeth.—Researches comparatively so novel and of such an extremely delicate nature, as the origin and growth of the teeth, requiring so much patience, so much technique, and such an experienced eye, are, as you can readily understand, not easily brought to the clear comprehension of every tyro in medicine or any of its specialties. We are, however, greatly pleased to see such a growing tendency, particularly among young men in this country, to do original work in this line of science. There are already in many of our dental schools chairs devoted to the department of microscopical anatomy of the teeth. In the last ten years a number of earnest workers in this country have published the results of their researches, and, tho they do not fully agree with our views, they still are deserving of great credit for the hard work they have done for our general information. Among them I will mention Andrews, Black, Sudduth, Williams, and Stowell.—*Dr. Frank Abbott.*

Bridging Teeth by Filling.—Not more than ten years ago a patient presented herself to me and exhibited a piece of work which had been done for her by another dentist during my absence from the city. He had filled two bicuspids, and the teeth being alive, to make his filling thoroughly secure he had occupied both cavities with it, thus bridging the teeth together permanently. What we term dental ethics prevented me from expressing to that lady the opinion I had of the man who gave her such a piece of work. In the interim from then till now my views have somewhat altered, and to-night I shall specifically recommend what then I should have severely criticised. Perhaps I am the more ready to do so since within a year I have seen the lady in question and found the teeth and fillings still in good order.—*Dr. R. Ottolengui.*

DISCOLORED TEETH.

Editor ITEMS:—In Dr. E. C. Kirk's article on bleaching teeth, in June ITEMS, page 272, he uses this language: "It is not necessary for one present purpose that we should know the exact composition of the *detritus of pulp tissue and broken down food substance, which give rise to tooth discoloration.*" My observation, for twenty years, has led me to believe that discoloration is caused by the breaking up of the red blood corpuscles, so that they are fluid, and can enter the dental tubuli.

Nearly all cases I have known the history of, the dentine has become a pink color first, and afterwards changed to a dark color.

The cause of the red blood corpuscles becoming fluid is a question I cannot answer. Some say by arsenic used in destroying the pulp. How is it where no arsenic, or any other drug, has been used, or even when the tooth receives a severe shock or is not at all broken? Can any one answer?"

Fenton, Mich. H. F. DOUGLAS.

Exhaustive and Exhausting Essays. In Southern Dental Association. I have known for a long time through the journals and through the papers that the essayists of this meeting were very learned men. But I did not know how learned they were till now, and I did not know they could get all they knew into one paper; and another thing, I did not know till now how little judgment they could display in pouring out all they did know in one single paper. I would like to make this suggestion, that hereafter our papers shall be short and sweet, so as not to weary the audience. I was so full when I went to dinner to-day that I could hardly eat. A good paper is a good thing, but too much of a good thing is too much of a good thing, and I dare say there is hardly one of you, even the essayists themselves, who will not bear me out in the assertion that the papers were too long, and they thought so themselves before they were through reading.—Dr. Storey, of Texas.

Dr. Friedrichs: I have been on the lookout for these symptoms that have been reported as occurring from the toxic action of cocaine. I have been using it in my practice, by injection, for the last two years. My son has a clinic in the Charity Hospital, where they extract no less than from fifteen to twenty and sometimes as high as forty and fifty teeth at a clinic. But neither in my son's practice nor in my own have there ever any symptoms of the toxic action of cocaine presented themselves. The nearest that I ever came to it was in the case of a lady who complained of a choking sensation after its use, and that she had palpitation of the heart; but in tracing the history of this patient I found that she was hysterical, and you all know that with hysterical

patients you may have such symptoms if you simply inject a drop of water. I use a four per cent. solution, and it is only necessary to pass the needle through the gum. As it is absorbed you will find it drives the blood away, and the spot becomes white until it spreads over the surface of the gum about the tooth that you desire to extract. Both sides require the same treatment, after which you should wait about three minutes before operating. Three out of four of my patients say it does not hurt at all, and the others say, "Well, I think it hurts, but still I think if it had not been for the cocaine, it would have hurt a great deal more." I do not think there was a fatal case recorded in the *British Journal*, when cocaine was applied for the extraction of teeth. The worst symptoms would pass away, and the longest continuance of bad symptoms that I remember occupied the space of two hours.

Hindrances to Dental Education in Europe.—The difficulty in the way of successfully inaugurating dental schools, especially on the European continet, is their dependence on universities, on the one hand, and the meddling of the governments with their administration on the other. In nearly all European countries, especially Germany and Austria, a great amount of preliminary education is required before a young man is admitted to a university. Then five years of hard work must be given to the study of medicine, before he can receive the degree of M.D. These, until quite recently, have been the preliminary steps to be taken before a specialty could be taken up. All that could be learned of dentistry was in a private office, where years had to be spent to become a dental doctor. Indeed, very few of those who had obtained the so-called academic degree were willing to devote their lifetime to the specialty of dental and oral surgery, it being considered rather an inferior calling for a highly educated medical man to pursue. —*Frank Abbott.*

In regard to the status of dentistry with medical men and in the courts. It was only last week that I witnessed an operation by a dentist in Philadelphia, in the hospital, under the care of physicians. The operation was to have been performed by a regular surgeon, but he was out of town, and the physician in charge sent for a dentist, having only a D. D. S. to remove a tumor which had an attachment to the process of the lower jaw. The tumor was removed, the process was cut away and drilled out sufficiently to eradicate the disease. The same dentist, I know, has within the last three months successfully removed a large portion of the inferior maxillary of three different patients. In reference to the legal status of the operation, I might give you a little experience that I had in court as a witness in two cases, one against one

of the ablest physicians in Philadelphia. The case was a prosecution for damages on a claim of malpractice. It came before one of our best judges, and after the prosecution had put in their evidence the judge ruled the case out of court. He said there was no evidence that the physician was not well educated and fully competent to perform the operation. Another case was where a dentist was prosecuted because inflammation and necrosis followed the extraction of a third molar. The judge said after hearing the prosecution that there was no evidence that the dentist had not been educated sufficiently to perform the operation, and therefore there could be no damages for the result. That I think would be the result in every court if it could be shown that the physician or the dentist had been properly educated, and there was no evidence to show that the operation had been performed in an unskilful manner.—*Dr. Pierce.*

A Remarkable Fistula.—In the *Dkutsche Monatschrift fur Zahnheilkunde* for December, 1888, Dr. Nicholai, of Stuttgart, gave the history of a case in which a fistula opening at the nipple was found to be connected with a diseased molar tooth. According to a summary in the *Centralblatt fur Chirurgie*, the connection was first inferred from the fact that the discharge from the opening just above the nipple ceased at once after proper treatment of the diseased left lower molar, and it was afterward proved by an injection of cochineal into the alveolus of the tooth, which caused a red coloration of the puss discharged at the nipple. Further examination showed that the puss had made its way through the maxilla, descended along the border of the sterno-cleido-mastoid muscle, perforated the fascia of the platysma myoides, and coursed over the pectoral muscle in the substance of the mammary gland. The fistula closed in twelve days after the removal of the diseased tooth.—*New York Medical Journal.*

EDITOR ITEMS OF INTEREST:—I have a case of bleeding gums about which I would like to hear from some of the profession. The gums are slightly inflamed at the free margin. There is at times slight deposit of sanguinary calculus under the free edge, tho her teeth are in good condition, and she is scrupulously neat about her mouth. The bleeding comes on at any time, but especially when eating, and is so profuse at times as to nauseate her. She has been under the treatment of several dentists of Memphis, Tenn., and other places; her father is a physician, she has been under my treatment for some time, but does not much improve. Her health is good otherwise. There is no calculus on her teeth.

Tuscumbia, Ala. HENRY S. DILL.

SAD.

ED. ITEMS:—Owing to a railroad accident on the 4th of May last, I lost my right arm, and with that, of course, my profession.

The June number of the ITEMS was received a few days ago. Its welcome visits for several years past, must now be to me a thing of the past, as well as the profession, in the interest of which, it has proved itself an able and valuable champion. The cover was marked with my expired subscription, and I write you with no little regret, for the necessity, that makes it necessary for me to discontinue it. I received some specimens of teeth from the Delaware Manufacturing Company, that I notice you have now united with, but I remailed them, and for the same reason that I now discontinue your interesting ITEMS OF INTEREST.

Very respectfully yours,

Lincolnton, Ga. GEORGE PATERSON.

Intermeddling With Nature.—"We are an inventive people," is a remark often heard with pride, not only from our own people, but from people the world over. Dentistry has shared the profits accruing from the inventive genius of Americans; but from the zeal for improvement and perfection no little harm has, in my judgment, resulted in many cases by overdoing the work of superintending the dentures of the young. I allude more particularly to the removal of certain teeth, or the filing or grinding away of portions of teeth, for the alleged purpose of making room, and thus preventing early and destructive caries. Too much, in my judgement, cannot be said in condemnation of such practice as a rule. It is true that under some circumstances it is undoubtedly good practice, but they are exceptional cases. This brings us to the very foundation of all rational practice of dental surgery, viz, that of education, experience, sound judgment, and, last but not least, honesty.—*Frank Abbott.*

Legal Professional Responsibility,—Dr. Freeman, of Nashville, Tenn., says: "As to the medico-legal standpoint, down in my section of the country the most eminent surgeons dare not hold property in their own names, because the settlement of such questions rests very much with the judge and jury.

"The dental profession arose because of a necessisy for it. It is a profession, and we call it a specialty because it is recognized the world over as a branch of the healing art, and specialties to-day are popular. To qualify men for the practice of this demanded a certain line of education, and those who followed it were called dentists. The medical profession sneered at them because medical men did not know anything about the needs or qualifications of dentists. There are medical men in the land to-day who cannot tell how many teeth there

should be in the mouth. Now and then throughout the land some medical men of highest attainments would recognize men of talent and say, 'Come in; you are practicing the healing art.' But the profession at large did not recognize us at all. Dentistry has grown of itself. We are as distinct a profession as any other. The community at large recognize us, and I am proud that the D. D. S. is all-sufficient, tho I, as was popular when I first started out, thought it desirable to have the M. D., and therefore I sought and received it. What we need is more colleges and a higher education, and the dental profession will do as much as the M. D.'s toward the relief of humanity."

Cocaine as a Poison.—Dr. Storey, of Dallas, Texas, says: The paper of Dr. Knapp with reference to the use of cocaine reminded me of something that happened just before I left home. In using some of it as a spray in a gentleman's throat, a little was spilled on the floor. This occurred at night. We have plenty of rats in Texas, and the next morning three dead rats were found near there. To determine whether it was the cocaine that killed the rats, a four per cent. solution was placed where they could get at it, and lying immediately where it was put were four dead rats the next morning. It will kill folks, too, as it will kill rats. We have had some ugly cases of cocaine-poisoning in Dallas.

Surgery by Dentists.—Dr. Thackston, of Farmville, Va., says: "Some of grandest and most brilliant operations which have illustrated the superiority of American surgery have been performed by dentists holding only the degree of D. D. S., and it is only necessary for me to remind you of Dr. Hullihen, of Wheeling. One of the most difficult and formidable operations known in surgery was performed by him, and he was sustained, not only by the laws of the land, but received the grateful acknowledgement of surgeons, physicians, dentists and the parties interested. That was only one of a number of important surgical operations that have been performed by dentists, and in all instances where dental talent has been employed in the performance of formidable surgical operations there has been no attempt at prosecution or effort made either by physicians, surgeons, or ministers of the law to prevent their performance."

The Cell and the Bioplasson.—Whereas the *cell* theory considered the cells as stable and unchangeable formations, the *bioplasson* theory suggests a continuous oscillation of the form elements, or continuous ups and downs in their appearance, till a certain tissue is perfected. This same process of oscillation takes place in all pathological conditions, for the benefit of newly-formed tissues, such as vaso-dentine and osteo-dentine.—*Dr. Frank Abbott.*

HISTORICAL SKETCH OF THE DENTAL COLLEGE OF THE UNIVERSITY OF MICHIGAN.

DR. N. F. HOFF, Ann Arbor, Mich.

In 1865, an effort was made by members of the dental profession in Michigan to have a department of dentistry established in connection with the University, but it failed for lack of funds.

In reply to a petition of dentists and others, the Legislature of 1874 and 1875 made an appropriation for establishing the Dental Department.

At a meeting of the Board of Regents, held June 29th, 1875, the dental college was organized, and by request of the Michigan Dental Society, Dr. Johnathan Toft, of Cincinnati, was invited to become Professor of the Principles of Dental and Medical Surgery, and to organize the college for work, which he did. Dr. C. L. Ford, Professor of Anatomy in the Medical Department, was elected Professor of Dental Anatomy, Dr. J. A. Watling, Professor of Clinical and Mechanical Dentistry, and Dr. W. H. Jackson, Demonstrator of Mechanical Dentistry.

The first session of the school opened October 1st, 1875, with a class of twenty students in attendance, and closed the last of March, graduating a class of eight.

By generous donations and purchases a library was at once begun, which has now increased to over 500 volumes, containing most of the works published on dental science, and a complete file of every dental journal published in the United States. Some of these files are not complete, but it is hoped in time to have them all entire. It also contains a file of the British dental journals, and a large number of printed transactions of dental societies. The library is shelved in the dental building, and is accessible to the students, and is very much sought and used by them. It is probably one of the largest libraries in dental journals in the country, and it is the aim of the faculty to make it complete.

Through the generosity of Prof. Ford and the liberality of the Regents, a large collection of preparations, models, skulls, teeth, etc., have been prepared, and occupy a large room in the dental building. They furnish an invaluable aid in the instruction of the class.

In 1879, the building occupied by the college was found to be inadequate to accommodate the students, and a large addition was made, furnishing a commodious operating room and laboratory, and the old building was so remodeled as to fit it for other college uses. The constantly increasing number of students, and the enlarging of the curriculum of study, has again demanded more commodious accommodations. The Legislature, at its last session, made a special

appropriation for this purpose, which when completed will, it is expected, supply all present needs and provide for future contingencies.

The instruction in the medical branches, viz.: General anatomy, practical anatomy, histology, physiology, general materia medica and therapeutics, general and analytical chemistry, is given by the regular medical faculty, in the medical building, in the same classes with the medical students. The special dental instruction is given by the dental faculty—consisting of six professors—in the dental building.

Notwithstanding the fact that the requirements for admission have been made higher, and the time required for attendance has been extended to a three-years' course of nine months each, the classes are increasing.

It is the ambition of the faculty to present the broadest and most complete course of instruction in dental science and art possible, and our presiding genius, Prof. Taft, is zealously recording their efforts.

THE NEW COLORADO DENTAL LAW.

The Examining Board appointed by the Governor under "act" passed by our last Legislature, were in session June 24th, 25th and 26th, and examined 110 applicants, and but a small number failed to get certificates, and about 25 or 30 more failed to materialize before the Board; most of these will wend their way westward. The law requires that *all* dentists in practice at the time this law went into effect and all that may come to our State hereafter shall be required to pass an examination before the Board of Examiners appointed by the Governor. Hence the graduates or non-graduates, if they wish to *continue* or *commence* the practice of dentistry in this State must first pass a creditable examination. The members of our Examining Board are: J. M. Porter, D.D. S., P. T. Smith, D.D. S., J. M. Norman, D.D. S., of Denver, and Dr. Wm. Fowler, of Colorado Springs, and J. N. Chipley, D.D. S., of Pueblo.

The Colorado Dental Society was in session during the 26th, 27th and 28th of June. Many interesting papers were read and discussed. The membership more than doubled at this meeting. J. M. Porter, D.D. S., was elected president for next year, and P. T. Smith, D.D. S., delegate to the American Dental Association. W. S. B.

Manners and Social Usages, by Mrs. John Sherwood, is a complete treatise of what ought and ought not to be done and said in "good society." It is a valuable book, especially for young people just entering "polite society." Harper Brothers, New York.

Our Many Dental Colleges.—I am sorry to see one who is professedly in favor of higher education for the dentist decry the multiplication of colleges for the dissemination of knowledge. It is certainly an inconsistent position. Knowledge is spread only in these ways, and when it is intimated that the increased number of colleges is prompted by mercenary motives and comes from the "lower strata" in the profession, is a statement which cannot be substantiated, and which I am sorry to hear made. I think the new dental colleges, as well as the old, have been originated and are carried on by those who are in favor of higher education.—*Dr. Patterson.*

College Education.—Dr. Wright, of Columbia, S. C., says: "Referring to the matter of education, whether it be general medicine or dentistry, it may be said that the college student rarely acquires more than the faculty of learning how to learn. Few schools educate a man and qualify him to follow any vocation, or fit him for every condition in which he may be placed. If he stops, whether he be in medicine or dentistry, where his college dismisses him with his diploma, that man is essentially a professional failure."

Combinations.—The publishers of the *Cincinnati Medical Journal* say: Our readers, especially the Dentists, know what our opinion is in regard to Dental Dealers' Combinations, and in fact all other combinations and trusts. We publish the bill recently passed in Missouri, to which we call especial attention. We are glad to see that trusts and combinations are becoming more and more unpopular. We expect to hear from other States, and will keep our readers posted as the work advances.

Cocaine.—Dr. Sudduth says: When cocaine was first brought out I was assistant in a surgical clinic at Philadelphia, and we had quite an extended experience in its use. It was used in strengths varying from four to fifty per cent. We had none of the bad experiences that we have heard about from other quarters. I have followed the history of this drug very closely since that time, and have come to the conclusion that cocaine is like a great many other drugs that we use. In certain cases idiosyncrasies render it unsafe, but, as a rule, I think it is as safe as any local anesthetic that we have ever used.

IT WASN'T HIS TOOTH.—Countryman to Dentist.—I wouldn't pay nothing extra for gas. Just lug her out. Never mind if it does hurt.

Dentist.—Well, you are plucky, sir. Let me see the tooth.

Countryman.—Oh, tain't me that's got the toothache; it's my wife. She will be here in a minute.

For Our Patients.

OUR TEETH.

From Pamphlet published by the Illinois Dental Society.

STRUCTURAL ELEMEMTS OF THE TEETH.

The different structures composing the teeth are—

1. *Enamel,* which covers the entire crown or visible part of the tooth.

2. *Dentine,* which constitutes the main portion of the tooth. It is not visible, owing to the cap of enamel which covers it.

3. *Pulp,* a pale, flesh-like mass (improperly called "nerve"), which occupies the interior cavity of the tooth. It is abundantly supplied with nerves and blood-vessels, which enter through the *apical foramen,* a small orifice at the end of the root.

4. *Cementum,* a thin, bony structure, coating the entire root of the tooth.

5. *Pericementum, or peridental membrane,* a thin, fibrous membrane, or envelope, which surrounds the roots and unexposed parts of the tooth, and connects it with the bony socket of the jaw.

The temporary upper teeth are composed of four incisors, two cuspids, and four molars. The under set has the same number, making twenty in all. The lower teeth are somewhat smaller than the upper.

The upper molars usually have three roots, the lower molars two.

Counting from the center line of the mouth, backward, when the teeth are in place, the SIXTH TOOTH WILL BE THE FIRST MOLAR OF THE PERMANENT SET, AND IS NEVER SHED.

THE PERMAMENT OR SECOND SET OF TEETH.

These comprise thirty-two teeth—sixteen in either jaw. They take the places of the temporary teeth, and are larger and stronger, as well as more numerous. The six front in each jaw correspond to six of the temporary teeth, and take the same names. The next two on each side are bicuspids, which replace the temporary molars, and the remainder are the permanent molars, which are situated still further back in the growing jaws, which elongate to make room for them.

THE ERUPTION OR "CUTTING" OF THE TEMPORARY TEETH.

This process, frequently called "teething," takes place at about the following periods, the lower ones a little earlier than the upper: The central incisors appear about the seventh month, the lateral incisors about a month later; the anterior molars about the thirteenth month; the cuspids about the sixteenth month, and the posterior molars about the twenty-fourth month.

These are the average periods of eruption, the actual time being

variable. In rare cases several teeth are erupted before the birth of the child, and in others their appearance is much delayed.

THE AFFECTIONS ARISING FROM "TEETHING."

Tho the eruption of these teeth is a natural or physiological process, it is generally attended with considerable local irritation and constitutional disturbance; indeed, this is perhaps the most critical period in the child's life. A delicate infant generally suffers more than a robust one, and teething when premature is said to be attended with more danger than when longer delayed. The diseases accompanying dentition belong to the province of the physician rather than the dentist. This subject will, therefore, be dropt, with merely a few words of suggestion. Strict attention should be given to the diet, to cleanliness, and to exercise in the open air. The proper quality and amount of clothing is also of great importance. If the mother does not afford sufficient nourishment, other means should be taken to generously nourish the child.

Lancing the gums, when properly done, and at the right times, often affords immediate relief. But upon all of these points the family physician or dentist should be the adviser.

THE ERUPTION OF THE PERMANENT TEETH.

The eruption of these teeth is accompanied with comparatively slight annoyance, and produces but little local or constitutional disorder. The eruption of the "wisdom teeth," *i. e.*, third molars, is often, however, a painful exception, for in many instances the development of the jaws is insufficient to afford them standing room, and their coming is the occasion of much annoyance, and sometimes causes serious complications.

The periods at which the permanent teeth are erupted are about as follows: The first to appear are the first molars, commonly known, from the average time of their eruption, as the *sixth-year molars*. There are four, one on each side of the upper and lower jaws. They come in behind the temporary set, and are often mistaken for temporary teeth. They are a little larger, somewhat darker, and less pearly in appearance than the sound temporary teeth. These are the most important teeth in the jaws for the purpose of mastication, somewhat more liable to decay than the molars next erupted, and should be carefully watched, especially between the seventh and fifteenth years. The next to appear, and about a year later, are the central incisors, the upper teeth a little later than the lower.

The lateral incisors show themselves about the eighth year, and, like the preceding, there are four. About a year later we discover the four anterior, or first bicuspids; these take the places of the first molars of the temporary set. About the tenth year appear the four sec-

ond bicuspids, and take the places of the second deciduous molars, and after another year the four cuspids. The places of these are between the lateral incisors and the first biscuspids, which have already been erupted. The permanent cuspids often come before the temporary are shed, and are by them crowded outward, so as to have the appearance and take the name of "tusks."

The next teeth to erupt are the second molars, called by many the "twelfth-year molars," as they emerge from the gums when the child is twelve years old. The last to appear are the third molars (*dentes sapientie*), or "wisdom teeth," varying in the time of eruption from the seventeenth to the twenty-fifth year, or even later.

THE ROOTS OF THE DECIDUOUS TEETH AND THEIR ABSORPTION.

It is supposed by some that the temporary teeth have no roots, but this is an error. When these teeth are fully grown, the roots are as large and as long, proportionately, as those of the permanent teeth. But as the time approaches that they naturally give way to their successors, the roots generally disappear by a process called absorption; so that these teeth, when shed, are in reality nothing but the crowns of the original teeth.

The removal of the roots of children's teeth is a painless process, and is one of the most wonderful operations in nature. It is accomplished through the agency of a *papilla* (a highly vascular structure, abounding in absorbent cells), which precedes the advancing permanent tooth, and clears a passage for it, almost to the surface of the gums, entirely removing the roots of the diciduous teeth. "Little by little, day by day, and month by month, these roots of the first teeth disappear, while the crowns of the second advance and occupy the space gained till the deciduous tooth drops out of the cavity, minus a root, while the crown of the permanent tooth is seen in its place."

This is the natural or physiological way by which the deciduous teeth are removed. But, unfortunately, it frequently happens that the roots are only partially taken away by this process. From some cause the agent that effects their removal has been interrupted in its work, or has been destroyed by the death of the pulp, or by an abscess on the root. In these, and perhaps in other cases, no further absorption takes place, and consequently, at the proper times, such teeth or roots must be removed by force.

TOOTH-ACHE OR ODONTALGIA.

Tho the causes and the kinds of toothache are numerous, most can be referred to two sources: the exposure, irritation or disease of the pulp (or "nerve"); or (the pulp being dead), the inflammation of the tissues surrounding the root (the peridental membrane.)

The first of these is not easily localized by the sufferer, and it is almost an every-day occurrence for patients to say a tooth is aching which proves to be healthy, and remote from the real cause of trouble. What are called sympathetic and reflex nervous irritations account for some of these instances of mislocation of pain. The remedy for this kind of toothache is to cleanse and disinfect the cavity of decay, and protect the pulp from all sources of subsequent irritation; or, if disease has gone too far, or rather circumstances make such treatment impracticable, then the pulp must be destroyed. It must be confessed that in nearly all pulps that have given severe pain for a considerable time, it would be better to destroy them at once than to attempt to save them alive. Age has a very important relation to this question, however, the loss of the pulp before the complete formation of the root of the tooth being usually disastrous, and its loss before mature age being far more injuries to the tooth than if it occurs later in life.

The death of the pulp is often followed by some soreness and apparent elongation of the tooth, which indicates that the peridental membrane has become irritated or inflamed. Swelling and suppuration succeed, terminating in an abscess, which usually opens through the gum opposite the root of the tooth; but occasionally the opening of the abscess is remote, and sometimes on the outside of the face. This latter calamity can almost always be averted by proper attention in time. The loss of a valuable tooth would often be preferable to an ugly scar on the face. This swelling and discharge is caused by what is popularly called a gumboil, an abscess on the end of a root. The duration and the extent of the swelling, and the severity of the pain accompying it, and usually there is considerable general disturbance, sometimes amounting to a serious illness.

Ordinarily there is a brief subsidence of the pain caused by an inflamed and dying pulp, before the beginning of that from the inflamed peridental membrane; but in numerous instances the suffering is continuous, and the soreness of the root membrane manifests itself with painful severity before the pulp became as nearly dead as to be free from pain.

The services of a dentist should be sought as soon as possible after the experience of any form of toothache. Like most other diseases, the difficulty, danger and suffering attending the treatment, and the injury likely to result, are often rapidly increased by delay.

CAUSES OF THE LOSS OF THE TEETH.

Two general causes may be assigned for the loss of the natural teeth. The first is dental caries (commonly called decay of the teeth) and the train of consequences usually following it. This is more frequent and destructive before mature age. The second is the wasting or

destruction of the gums and alveola processes, or thin soft-bone surrounding the roots, and final loosening of the teeth till they fall out, caused by the diseases of the root membrane having their origin at the margins of the gums. This is far more common in middle life and old age, but often has its beginning earlier. Calcareous deposits (tartar) are chiefly responsible for these results, and it is important therefore that all such deposits be removed, and the teeth kept clean of it.

WHAT KILLS THE CHILDREN.

Ignorance kills the children. Now and then accident lends a hand, as when some poor toddler tumbles into boiling water, or a weary, restless mother rolls upon her infant and stills its cries forever. But ignorance does the business generally, blind giant that he is, always ready to seize the pillars of everything and turn bright places of joy as dark as buried Babylon. Tradition clutches the hapless infant the moment it is born, and decrees that it shall be immersed in water. The prenatal environment has a temperature of about a hundred degrees. This cold world boasts of any temperature it pleases. That of the bath is also a movable feast. Under the circumstances, the custom of washing the new-born is not unlike, in effect, the refinement of cruelty that would grasp a man from his bed and thrust him ruthlessly into a snow-bank. The fact that childbirth is an exhausting process, even to the baby, is too often ignored. Time is required for necessary reaction. The little one needs repose as well as its mother, a good rest at the start to insure some health and strength for its future guerrilla warfare with life. If it were let alone, sleep would generally follow its preliminary outcries. But no; custom says the little pilgrim must be scrubbed, and scrubbed he is. He survives—as a general thing. But "How did my lamb get that dreadful cold and those bad eyes?" and "How he cries with colic!" It is possible to manage better, as for instance, in the Maternity Department of the Woman's Hospital in Philadelphia. There the eyes of new-born babies are washed with an antiseptic solution at the earliest opportunity. When the child is entirely born, it is left quiet on the mother's bed until the expulsion of all appendages, which usually occurs within an hour. The infant is then carried away just as it is, well wrapped up, and let alone. After the mother has received proper attention the child is cared for. One loose garment and a diaper are all it is burdened with in the way of clothes. Warmly covered, it is laid away in a little bed by itself, and neither washed nor dressed until twenty-four hours have elapsed, when it is carried to the baby's bath-room (which is properly heated), and there its toilet is performed for the first time. The physician in charge states that since this plan has been adopted the babies

thrive to a far greater degree and cry less. This method is at once rational and natural, and would seem to need no defense.

The maternal physique has some subtle, indefinable influence over young children, a health-giving power not at present well understood. The new baby is still in a sense a part of its mother, tho a separate unit. Its well-being requires close contact with her during the greater part of the twenty-four hours. A bed by itself is an injustice to helpless infancy. It is paterfamilias who should seek another resting place, not the new life as yet so frail and insecure. Only those who have tried this natural method can thoroughly appreciate its advantages and realize how admirably it insures the happiness of three persons. The child can be cared for during the night without exposure or any sudden chill. Always warmed and protected by a loving presence, the little one sleeps long and well. After the weaning period, the baby has his own bed as a matter of course. Till then, an undisputed half of the maternal couch is a necessity to the embrionic citizen, if he is to grow into that relative perfection of health and strength which nature has intended for him. The human mother is the only animal that puts away its young at night, probably because the right kind of reason has not yet taken the place of half-eradicated instinct. The hen gathers her brood under her wings; the mother bear forms herself into a sort of animate woolly nest about her cubs, just as the cat's body embraces her kittens. Our cousins of the lower orders may not be such bad examples to follow after all. At any rate, why not give those "wonderfu' weans" the benefit of the doubt?

The slaughter of the innocents goes on in different ways. Emotional prodigality is a most efficient means of removing the joys of a household. "Died of too much grandfather, grandmother, uncle and aunt" would be a fitting epitaph for many a bright child. Emotion is the most exhausting of all mental attributes. What children do, and how much, is of far less importance than the way in which they do it. The evils of premature mental activity are without doubt very great; but to prematurely and unduly excite emotional manifestations is tenfold more hurtful. In this regard there seems to be the densest ignorance. The fact that young children's only business in life is to develop slowly—to eat, sleep and play in childlike fashion—is too often forgotten in the home circle. On the contrary, they are supposed to attend to their own work of growing and developing, and afford fun for the family at the same time. Our tender little ones are made the playthings of the household—hugged, kissed, talked to, and made to talk, for the pleasure and gratification of the parents and friends. Their callow brains are overworked by exciting and intense emotion. What wonder they have big heads, little bodies, and hardly any digestion!

Editorial.

WHAT IS INFLAMMATION?

Most of our popular authors speak of inflammation as the result of a rush of blood to a part. We do not believe it. There is no more blood brought to the part we call inflamed than was brought to the part before inflammation existed. Inflammation is the *obstruction* of the flow of blood in a part; and this hindrance to its normal, free flow is what produces the heat, pain, swelling and final disorganization. There is always heat where there is friction, there is always pain where there is severe pressure on the nerves, there is always swelling where there is obstruction of the flow of blood through a part, and if this is not relieved, there is always disorganization.

The cause of fever is friction. The cause of pain anywhere in the system, and in every disease, is severe pressure on the nerves, slight pressure is pleasure, which is the opposite of *dis*-ease.

Headache is not caused by more than a normal quanity of blood forced to the head, or drawn there by excitement or other cause, but by its obstruction there.

The cause of inflammation may be simply irritation causing a contraction of the blood vessels producing *congestion*, which is a preceding state to inflammation. But more often inflammation is caused by the obstruction of the flow of the blood, produced by a flabby state of the blood vessels; and still more frequent by the presence of foreign or effete matter in the blood clogging the passages. The most serious character of inflammation is that caused by degeneracy of the blood—a separation of its fibrin from its watery portion. Two things follow: This fibrin lodges against the inner walls of the blood vessels, producing the most serious obstructions, and also it is almost impossible to prevent its degeneration into pus and complete disorganization of the part.

This tendency of the separation or the fibrin may be general or merely local; that is, it may be caused by a general impoverishment, or poisoning of the blood, or it may be from the condition of a part the blood in passing through.

In its healthy state, the blood is extremely limpid, fibrin is unseen, and the blood corpuscles are no obstruction to its flow; but only a little abnormality may cause its fibrin to appear as minute feathers or discs, and separating from the serum, lodge on the coatings of the blood vessels, and also obstruct their delicate valves. This may be over a large surface, as in rheumatism, or quite local as from a blow. If this state of thing is not relieved by what we call "resolution," it will terminate progressively in pus corpuscles, degeneration, disorganization, suppuration, gangrene, putrifaction, death—either local or general.

POST-GRADUATE SCHOOLS.

We have before referred to this beginning of a new system of instruction. It is being appreciated. The Chicago Dental College has just ended a four weeks course, the class consisting of 34 practitioners from various parts of the country. The class are highly pleased with the result, and recommend a similar course in other dental schools.

Dr. L. P. Haskell, of Chicago, has also been studiously working up a similar school for the instruction of mechanical dentistry, which has culminated in "The Chicago Post-Graduate School of Prosthetic Dentistry and Dental Laboratory."

These movements are in the right direction. There are, no doubt, thousands of dentists in every State of the Union, who will be glad to avail themselves of such schools, who could not leave their practice to attend two full terms, or even one term, at a regular college course; and, if they could, they would not be instructed as well as in these post-graduate schools; for these are more of the character of normal or teacher's schools, where very much of the alphabet of education is left out and the class is taken immediately into the heart of the subject.

TIME OF SETTING OF OXY-PHOSPHATE.

Dr. Chaplin, of the *Dental Office and Laboratory*, makes a singular table of comparative results, purporting to show a difference of from 5 to 50 minutes in the time of hardening of various cements. Flagg's Plastic Cement, for instance, is put as the slowest setting on the list, which is misleading.

For two years or more, the demand has been for a slow setting cement, especially for gold crown work, and great pains had been taken by some manufacturers to produce such a cement, which will, nevertheless, be strong when set. This depends on the preparation of the zinc. But fifty minutes, or a fourth of that time, would be tedious to the operator and indicate a weak cement.

To have a slow setting cement that is decidedly hard when set, the acid must be not only properly made, but comparatively fresh. If, therefore, Dr. C. takes one oxyphosphate that has been made a a year, another that has been made six months, and another three months, he will find a difference in the setting, tho the intrinsic quality of each may be similar. When we speak of slow setting oxy-phosphates we do not mean those setting slowly because damaged by age.

Till we were able to make our own cement slow setting, it was frequently complained of because it set too quickly, specially for crown work. Now the time of setting is regulated by the thickness of the mixture, tho, as with all cements, the longer the acid has been made the slower the setting. A few crystals in the fluid does no hurt.

OUR SPELLING.

In an article for a newspaper the other day we wrote stanch, and the editor promptly corrected it for "staunch." This reminds us of our villanous spelling. But, hold. Do we not again shock public propriety by writing "villanous" instead of *villainous?* for it will not do to take a word out of its accustomed mold without authority. And now we have "mold"; should we not have spelt it *mould?* And in this last sentence, is it not the hight of audacity to write "spelt" for *spelled?* But now we have written "hight" for height. Either we are not skilful in spelling, or our spelling is a little mixt. But, really, we are getting deeper and deeper into faulty spelling, unless we have authority for "skilful" and "mixt." What can be my defense for these irregularities? For if these are admitted, we might extend our catalog to a multitude of words. (And here is defense for defence, and catalog for catalogue.)

We have been censured for such spelling as balk, facit, gage, gantlet, gild, gant, gormand, hanch, mold, molt, molder, stanch, etc. True, we only leave out u in this class of words; but even this is awful in the eyes of some, unless we have "authority" for it. Then we have had the boldness to leave off the double l in such words as beveled, balister, calk, councilor, counsilor, driveler, dulness, enameled, groveler, quarreled, jeweler, paneled, pedlar, thraldom, traveler, wilful, woolen, &c. And we leave out the æ and œ.

Tho it is painful to our conservative friends, we leave off the final "e" in such words as agil, ax, antipyrin, anilin, benzin, bromin, by the by, dextrin, envelop, fibril, fibrin, futil, gelatin, glycerin, iodin, jasmin, kaolin, saccharin, &c.

Most of our lexicographers will not give sanction to such changes as the above, and there are but few of our public writers who do; but there are just enough to show a drift toward such changes, and over a thousand others we do not here mention, and we are glad to help them on. Webster agrees with nearly all of them.

For how senseless it is to spell "blessed" for blest, "burned" for burnt, "capped" for capt, "chapped" for chapt, "chopped" for chopt, "clapped" for clapt, "cramped" for crampt, "cursed" for curst, "dipped" for dipt, "dressed" for drest, "dripped" for dript, "dropped" for dropt, "fixed" for fixt, "lapped" for lapt, "learned" for learnt, "sopped" for sopt, "mopped" for mopt, "popped" for popt, "rapped" for rapt, "snapped" for snapt, "slapped" for slapt, "tipped" for tipt, "tripped" for tript, "vexed" for vext, "wrapped" for rapt, &c.? When these words were pronounced in two sylables there was some excuse for the popular spelling, but now there is no excuse; so that some of our dictionary makers, especially Webster, sanctions many of the above simplified spellings—enough to show that our public writers (who are the standard of spelling) are changing in this direction; and if all of us who are public writers adopt every change toward simplicity of spelling, as fast as we have any authority for it, we shall all hasten the glad day when we shall spell as we pronounce.

A SAD ACCIDENT.

A note from Mrs. J. W. Walker (Mrs. M. W. J.) immediately after her arrival home, to which she was called from a visit to us, by telegram, informs us of the accidental shooting of her daughter, Miss Flora, which will prove fatal. Mrs. W. will have the deepest sympathy of the whole profession.—*Southern Dental Journal.*

No, it was not a fatal shot, or at least has not yet proved fatal, though it is a wonder that the dear girl could have lived twenty-four hours. The ball (38 caliber) entered the skull one and one-half inches above the right ear, carrying with it splinters of the bone. Three weeks after the accident the ball and these pieces were successfully removed; and though the left (why the left?) side is still paralyzed, everything is progressing favorably. There is no pain, not even headache, and no abnormal condition of the pulse or temperature.

But it is a sad experience for Mrs. Walker, as well as for her daughter. She was quite out of health at the time, and had left home for rest and recuperation. The strain, however, instead of still farther depressing vitality, has produced her cure. But with the daily visits of two surgeons for so long a time, and so many other expenses, when, with her large family, her ordinary expenses were quite a strain on her, we do not see how she can keep her spirits up and her cupboard replenished.

PROF. J. TAFT,

Whose portrait we make our frontispiece, is the respected dean of the Dental Department of the University of Michigan. Both as editor of *The Dental Register* and as the presiding genius of this University, he has shown and still shows remarkable qualities as a dental educator. Probably there is no man living more popular in the dental profession of the West.

AMERICAN DENTAL ASSOCIATION.

The twenty-ninth annual meeting of the American Dental Association will be held at Saratoga Springs, Tuesday, August 6, 1889.

GEO. H. CUSHING.

THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The next meeting of the National Association of Dental Examiners will be held in Saratoga, N. Y., Tuesday, August 6th 9.30 A. M., and at other times during the week, between the sessions of the American Dental Association. It is important to have every State Board represented.

FRED. A. LEVY, D.D. S., *Secretary*.

Miscellaneous.

LOST ARTS.

Wendell Phillips, in his lecture on the "Lost Arts," in speaking of malleable glass, tells of a Roman who, in the age of Tiberius, had been banished. and returned to Rome, bringing a wonderful cup. This cup he dashed upon the marble pavement, and it was crushed, but not broken by the fall. Although somewhat dented, with a hammer he easily bent it into shape again. It was brilliant, transparent, but not brittle. He further states that the Romans obtained their chemistry from the Arabians, and that they brought it into Spain eight centuries ago. In the books of that age there is a kind of glass spoken of that, if supported by one end, by its own weight in a day's time would dwindle down to a fine line, so that it could be curved around one's wrist like a bracelet.

The art of luminous painting was known to the Japanese nine hundred years ago, and an extract from one of their old writers has been translated as follows: "One Su Ngoh, many years ago, had a picture of an ox. Every day the ox left the picture frame to graze and return to sleep within it at night. This picture came into the possession of the Emperor Tai Tsung, of the Sung dynasty (A. D. 976–998), who showed it to his courtiers, and asked them for an explanation, which none of them, however, could give. At last a certain Buddhist priest said that the Japanese found some nacreous substance within the flesh of a certain kind of oyster they picked up when the rocks were bared at low tide, and that they ground this into color material, and then painted pictures with it which were invisible by day and luminous by night." The secret simply was that during the day the figure of the ox was not visible, and it was therefore said that it left the frame to go grazing.

Many instances of remarkable mechanical ingenuity are related by various ancient authors. In the year 1578, the twentieth of Queen Elizabeth's reign, one Mark Scallott, a blacksmith, made a lock consisting of eleven pieces of iron, steel, and brass, with a hollow key to it, that altogether weighed but one grain of gold. He also made a gold chain, composed of forty-three links, which he fastened to the lock and key. In the presence of the Queen he put the chain about the neck of a flea, which drew it with ease, after which he put the lock and key, flea and chain, into a pair of scales, and they together weighed but one grain and a half. This almost incredible story is vouched for by an old writer.

Myrmecides, an ancient carver, was also so proficient in microscopic mechanism that he made an ivory chariot with four wheels, and as many harnessed horses, in so small a compass that a fly might have hidden them all under its wings. The same artisan made a ship with all her decks, masts, yards, rigging, and sails, which took up scarcely more room than the chariot.

The silver sphere, "a most noble and ingenious performance," which was presented to Sultan Solyman the Magnificent by his Imperial Majesty Ferdinand, is mentioned by Paulus Jovius as showing

and keeping time with the motions of the celestial bodies in their various configurations. It was carried to Constantinople by twelve men, and there put together by the artist that made it.

An artificer named Cornelius Van Drebble once made an instrument like an organ, that, being set in the open air under a warm sun, would play airs of itself without the keys being touched, but would not play in the shade. For this reason it is supposed that it was inclosed air, rarefied by the sun, that caused the harmony. George Whitehead, an Englishman, made a ship, with all things pertaining to it, to move as if it sailed upon a table. "All hands were aloft, a woman made good music on a lute, and a little puppy cried in the midship, all of which variety," quaintly says an old author, "was very pleasant and diverting."

Proclus, whose fame in mathematics equaled that of Archimedes, is said to have made burning glasses in the reign of Anastasius Dicorus, of such wonderful efficacy that at a great distance he burnt and destroyed the Mysian and Thracian fleet of ships that had blockaded Byzantium. The Damascus blades, as marvels of perfect steel, have long been famous, and even those used in the crusades are as perfect to-day as they were eight centuries ago. One on exhibition in London could be put into a scabbard almost as crooked as a corkscrew, and bent everyway without breaking. The point of this sword could be made to touch the hilt.

The poets have celebrated the perfection of Oriental steel, and many famous writers have sung its praises Scott, in his "Talisman," describes a meeting between Richard Cœur de Lion and Saladin. Saladin asks Richard to show him the wonderful strength for which he is noted, and the Norman monarch responds by severing a bar of iron which lies on the floor of the tent. Saladin says, "I cannot do that," but he takes an eider down pillow from a couch, and drawing his keen blade across it, it falls in two pieces. At this feat Richard says: "This is the black art—it is magic; you cannot cut that which has no resistance." Saladin, to show him that such is not the case, takes his scarf from his shoulders, which is so light that it almost floats in the air, and, tossing it up, severs it before it can descend. That Scott's story is not an exaggeration is proved by a traveler who once saw a man in Calcutta throw a handfull of floss silk into the air and a Hindoo sever it into pieces with his saber.—*Pittsburgh Dispatch.*

A Far-Sight Machine.—Mr. Edison is reported, in a conversation with a reporter who solicited his ideas on the subject of the projected world's fair in New York City, as saying that he would take an acre of space in such a fair and completely cover it with his inventions, of which he has no less than 70 now under way. "One of the most peculiar, and now promising good results," said Mr. Edison, "is what I may call a far-sight machine." By means of this extraordinary invention, the *Electrical Review* says, he hopes to be able to increase the range of vision by hundreds of miles, so that, for instance, "a man in New York could see the features of his friend in Boston with as much ease as he could see a performance on the stage. That," he added, "would be an invention worthy a prominent place in the world's fair, and I hope to have it perfected long before 1892."

The Value of an Idea.—The value of little inventions has had a singular proof or manifestation lately in the great run on "pigs in clover," a puzzle that has, we venture to say, been seen by nearly all our readers, for it has already made its way everywhere. Mr. C. M. Crandall, the inventor of this toy, says that for twenty years past he has had his mind on the availability of the rolling of marbles for a toy, and that in his model room the first experiment with the "pigs" took the form of a table, two feet in diameter, on a ball and socket joint. This was soon reduced to the hand toy now so familiar, of which 300 gross have been turned out daily for some time, while the demand has not yet been met by the supply. Mr. Crandall is a prolific inventor of toys, but it will be noted that it was twenty years before he evolved this last popular novelty in practical form. His perseverance and his success should give encouragement to other inventors, many of whom are at this very moment working upon new ideas of at least equal worth and utility. In the field of electricity alone, there is room for scores of Crandalls, who in some way or other are to hit the needs and fancies of the public. One does not look for the invention of such great novelties as the telegraph, the telephone, the electric light, and the electric motor every day of the week; but electrical improvements and devices, may be arrived at endlessly, and are not to be despised. —*The Electrical World.*

The World Full of Death Traps.—According to the *American Analyst*, the worst enemies of the human race are the doctors, who try to prolong our miserable existence in a world full of death traps. One medico tells you not to eat or drink what you relish because you will eat or drink too much. Another says that you must only eat what you fancy, because otherwise you will bolt your food without giving to each morsel the thirty-six mastications which are necessary for digestion. You must wear a respirator over your mouth, a pad on your chest, and a swarth of flannel round your loins. If you live in town, you will die of fog; if you go to the country, you will be poisoned by bad drainage; if you drink water, you are tempting the typhoid fiend; milk spells scarlatina, and tea-cake is sudden death. Do you shun these tempestuous pleasures of the senses and take refuge in the recreation of the mind? Do you borrow a novel from the circulating library? That is to import the germs of disease into a healthy household. The volume in your hands may have been perused by a person recovering from an infectious illness!

Fresh Boiled Water Necessary for a Good Cup of Tea.—All tea and coffee drinkers can tell by their taste if the water from which the beverage is made has not boiled or has boiled too much. Either of these conditions will spoil the flavor of the costliest tea or the best coffee berry. But not every one knows the reason or how to avoid the result.

The secret is in putting good fresh water into a clean kettle already warm and setting it to boil quickly, then taking it right off to use in tea, coffee, and other drinks before it is spoiled. If the water is allowed to steam and simmer and evaporate till all the good of the water is in the air, and the lime and iron and dregs left in the kettle, you must not expect a well flavored cup of tea or coffee.